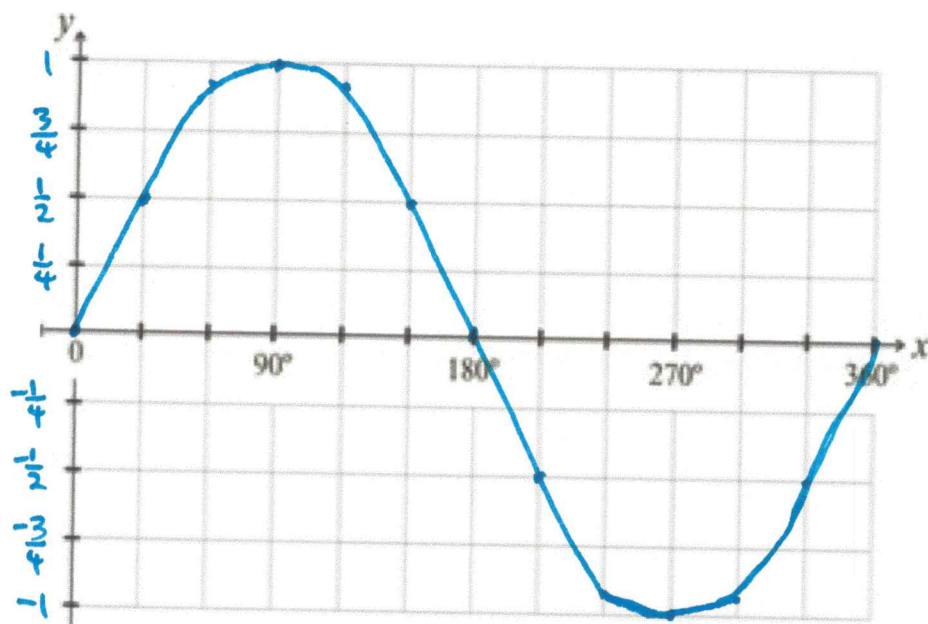


Name: Answers

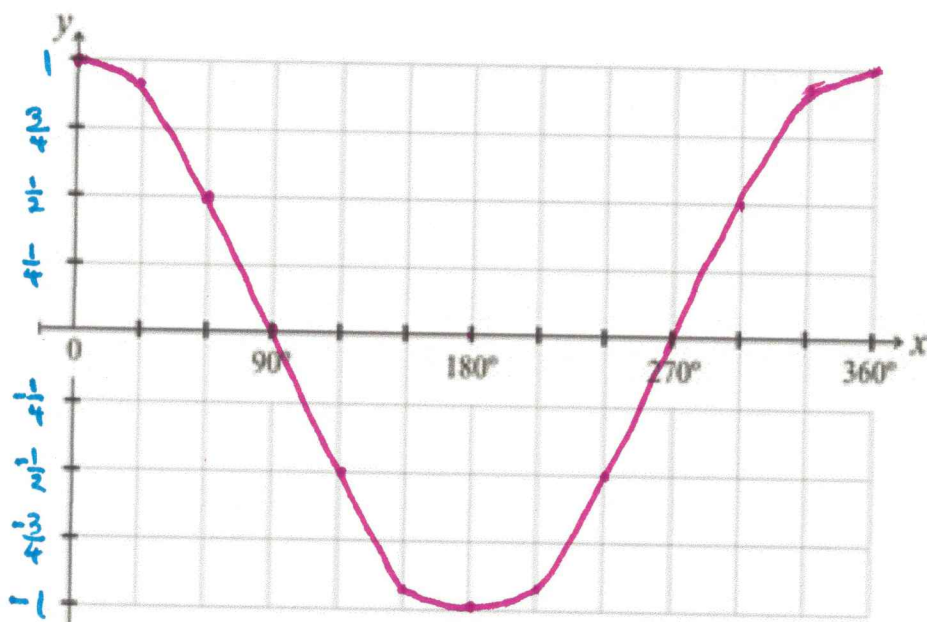
1. Without using a calculator, evaluate each inverse trig expression:

a) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = 60^\circ \text{ or } \frac{\pi}{3}$	b) $\cos^{-1}\left(\frac{\sqrt{2}}{2}\right) = 45^\circ \text{ or } \frac{\pi}{4}$
c) $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = 30^\circ \text{ or } \frac{\pi}{6}$	d) $\tan^{-1}(1) = 45^\circ \text{ or } \frac{\pi}{4}$
e) $\sin^{-1}(1) = 90^\circ \text{ or } \frac{\pi}{2}$	f) $\tan^{-1}(\sqrt{3}) = 60^\circ \text{ or } \frac{\pi}{3}$
g) $\cos^{-1}(1) = 0^\circ \text{ or } 0$	h) $\sin^{-1}(-1) = -90^\circ \text{ or } -\frac{\pi}{2}$
i) $\cos^{-1}(-1) = 180^\circ \text{ or } \pi$	j) $\sin^{-1}\left(\frac{-1}{2}\right) = -30^\circ \text{ or } -\frac{\pi}{6}$
k) $\cos^{-1}\left(\frac{-1}{2}\right) = 120^\circ \text{ or } \frac{2\pi}{3}$	l) $\cos^{-1}(0) = 90^\circ \text{ or } \frac{\pi}{2}$

2. Thinking in terms of degrees, graph one period of the sine function on the interval  $0^\circ \leq x \leq 360^\circ$ , i.e. graph  $f(x) = \sin(x)$ . What is the amplitude?

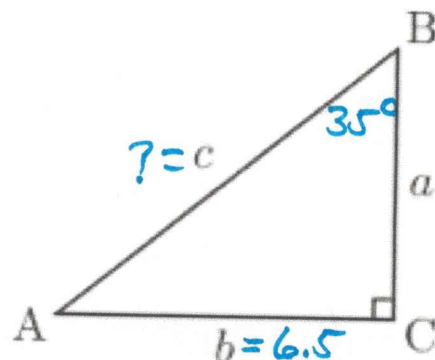


3. Thinking in terms of degrees, graph one period of the cosine function on the interval  $0^\circ \leq x \leq 360^\circ$ , i.e. graph  $g(x) = \cos(x)$ . What is the amplitude?



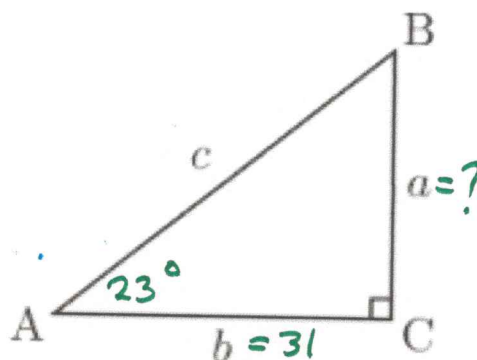
4. In right  $\triangle ABC$ ,  $b=6.5$  and  $B=35^\circ$ . Determine the value of  $c$ .

$$\begin{aligned}\sin 35^\circ &= \frac{6.5}{c} \\ c \sin 35^\circ &= 6.5 \\ c &= \frac{6.5}{\sin 35^\circ} \\ c &\approx 11.332\end{aligned}$$



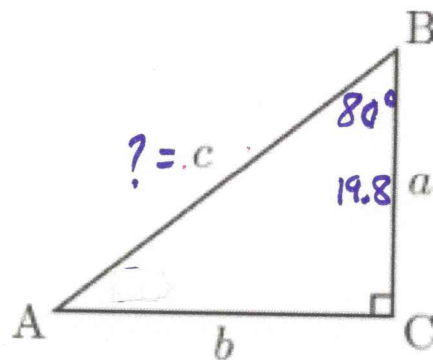
5. In right  $\triangle ABC$ ,  $b=31$  and  $A=23^\circ$ . Determine the value of  $a$ .

$$\begin{aligned}\tan 23^\circ &= \frac{a}{31} \\ 31 \tan 23^\circ &= a \\ 13.159 &\approx a\end{aligned}$$



6. In right  $\triangle ABC$ ,  $a=19.8$  and  $B=80^\circ$ . Determine the value of  $c$ .

$$\begin{aligned}\cos 80^\circ &= \frac{19.8}{c} \\ c \cos 80^\circ &= 19.8 \\ c &= \frac{19.8}{\cos 80^\circ} \\ c &\approx 114.024\end{aligned}$$



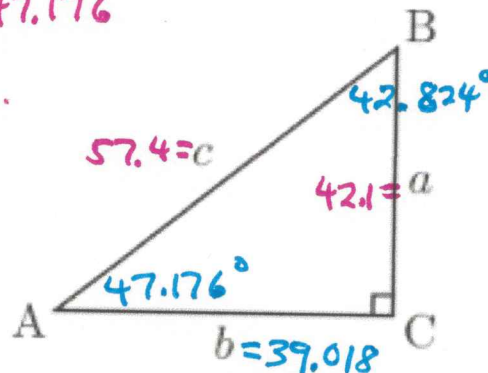
7. In right  $\triangle ABC$ ,  $a=42.1$  and  $c=57.4$ . Solve the triangle.

$$\sin A = \frac{42.1}{57.4} \quad A = \sin^{-1}\left(\frac{42.1}{57.4}\right) \approx 47.176^\circ$$

$$\begin{aligned}B &= 90^\circ - A \approx 90^\circ - 47.176^\circ \approx 42.824^\circ \\ B &\approx 42.824^\circ\end{aligned}$$

$$\tan A = \frac{a}{b} \quad \tan 47.176^\circ = \frac{42.1}{b}$$

$$b = \frac{42.1}{\tan 47.176^\circ} \approx 39.018$$



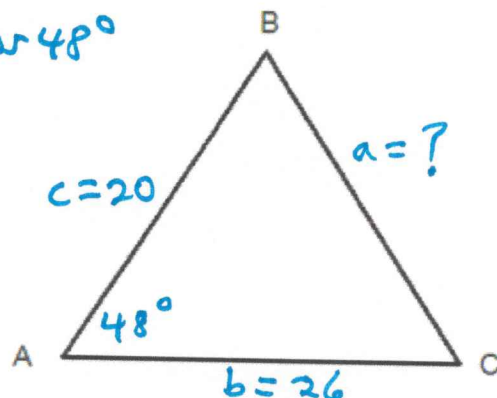
8. In  $\triangle ABC$ ,  $c=20$ ,  $b=26$ , and  $A=48^\circ$ . Determine the value of  $a$ .

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$a^2 = 676 + 400 - 2(26)(20) \cos 48^\circ$$

$$a^2 \approx 380.104$$

$$a \approx 19.496$$



9. In  $\triangle ABC$ ,  $a=10.4$ ,  $c=18.6$ , and  $b=21.7$ . Determine the value of  $B$ .

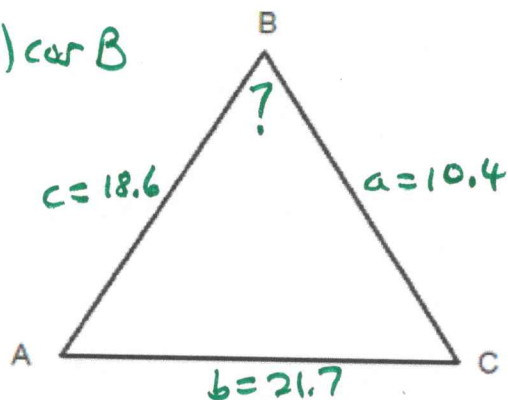
$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$21.7^2 = 10.4^2 + 18.6^2 - 2(10.4)(18.6) \cos B$$

$$16.77 \approx -386.88 \cos B$$

$$-0.0433 \approx \cos B$$

$$92.484^\circ \approx B$$



10. In  $\triangle ABC$ ,  $b=11.4$ ,  $a=22.5$ , and  $c=29.8$ . Solve the triangle.

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$22.5^2 = 11.4^2 + 29.8^2 - 2(11.4)(29.8) \cos A$$

$$0.75319 \approx \cos A$$

$$41.132^\circ \approx A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$11.4^2 = 22.5^2 + 29.8^2 - 2(22.5)(29.8) \cos B$$

$$0.9428 \approx \cos B$$

$$19.468^\circ \approx B$$

$$A + B + C = 180^\circ$$

$$41.132^\circ + 19.468^\circ + C \approx 180^\circ$$

$$C \approx 119.3995^\circ$$

